

# TA-F45

*US Model  
Canadian Model  
AEP Model  
UK Model*



## INTEGRATED STEREO AMPLIFIER

### SPECIFICATIONS

#### GENERAL

**Power Requirements:** 120 V ac, 60 Hz (US, Canadian model)  
220 V ac, 50/60 Hz (AEP model)  
240 V ac, 50/60 Hz (UK model)

**Power Consumption:** 90 W (US model)  
140 W (Canadian model)  
220 W (AEP model)  
260 W (UK model)


**AC Outlets:** 1 switched, 100 W (at max.)  
(US, Canadian model) 2 unswitched, total 100 W (at max.)

**Dimensions:** Approx. 430 (w) x 80 (h) x 335 (d) mm  
17 (w) x 3 1/4 (h) x 13 1/4 (d) inches  
including projecting parts and controls


**Weight:** Approx. 4.4 kg, 9 lb 12 oz (net)  
Approx. 5.5 kg, 12 lb 3 oz (in shipping carton)

— Continued on page 2 —

#### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

#### ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE  SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLODÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OUDANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

#### WARNING!!

THIS SET USES THE SWITCHING-TYPE POWER-SUPPLY CIRCUIT, WHICH IS DIRECTLY CONNECTED TO THE AC POWER LINE. AN ISOLATION TRANSFORMER SHOULD BE USED BETWEEN THE AC OUTLET AND THE AC PLUG OF THE SET DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD WHEN REPAIRING THE POWER SUPPLY CIRCUIT.

# SONY

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## SERVICE MANUAL

# TA-F45

## AMPLIFIER SECTION

### Power Output and Total Harmonic Distortion: (US, Canadian model)

With 8  $\Omega$  loads, both channels driven, from 20 – 20,000 Hz; rated 50W per channel minimum RMS power, with no more than 0.008 % total harmonic distortion from 250 mW to rated output.

### Continuous RMS Power Output:

(Less than 0.008% THD, both channels driven simultaneously)  
(AEP, UK model)

At 20 – 20,000 Hz  
50 W + 50 W (8  $\Omega$ )  
According to DIN 45500  
50 W + 50 W (8  $\Omega$ )

### Power Bandwidth: (IHF)

5 – 30,000 Hz (AEP, UK model)

### Harmonic Distortion:

Less than 0.008 % at rated output  
Less than 0.006 % at 25 W output

### Intermodulation (IM) Distortion:

(60Hz : 7kHz = 4 : 1)

Less than 0.008 % at rated output  
Less than 0.006 % at 25 W output

### Frequency Response:

PHONO RIAA equalization curve  $\pm 0.2$  dB

TUNER

AUX : 5 – 70,000 Hz  $\begin{matrix} +0 \\ -1 \end{matrix}$  dB

TAPE 1, 2

### Residual Noise:

Less than 130  $\mu$ V (8  $\Omega$ , Network A)

### Damping Factor:

50 (8  $\Omega$ , 1 kHz)

## Inputs:

	Setting of the CARTRIDGE LOAD selector	Sensitivity	Impedance	Maximum input capability (1 kHz)	S/N (weighting network, -input level)
PHONO	180 pF 330 pF	2.5 mV	50 k $\Omega$	150 mV	90 dB 78 dB* (A, 2.5 mV)
	40 $\Omega$ 3 $\Omega$	0.17 mV	100 $\Omega$ 33 $\Omega$	11 mV	75 dB 74 dB* (A, 0.25 mV)
TUNER AUX TAPE 1, 2	—	150 mV	50 k $\Omega$	—	104 dB 78 dB* (A, 150 mV)

\* '78 IHF

Measured with rated output power into 8-ohm loads (both channels driven simultaneously) at 1 kHz

## Outputs:

	Voltage	Impedance
REC OUT 1, 2	150 mV (-14.5 dB)	4.7 k $\Omega$
SPEAKER A, B	Accepts speakers of 8 – 16 $\Omega$	
HEAD- PHONES	Accepts low and high impedance headphones.	

**Tone Controls:** BASS  $\pm 10$  dB at 100 Hz  
(turnover frequency: 500 Hz)  
TREBLE  $\pm 10$  dB at 25 kHz  
(turnover frequency: 5 kHz)

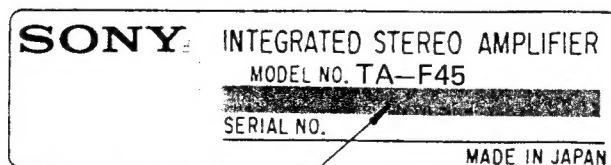
**Loudness:** +10 dB at 100 Hz, +3 dB at 10 kHz  
(att. 30dB)

**Low Filter:** 6 dB/octave attenuation below 15 Hz

0 dB = 0.775 V

## MODEL IDENTIFICATION

### Specification Label



US model : AC 120V 60Hz 90W  
Canadian model : AC 120V 60Hz 140W  
AEP model : AC 220V  $\sim 50/60$ Hz 220W  
UK model : AC 240V  $\sim 50/60$ Hz 260W

## 1. REPLACEMENT OF THE TRANSFORMERS IN THE INVERTER CIRCUIT

The lead wire arrangement for each of T901 and T902 in the inverter circuit are shown in Fig. 1.

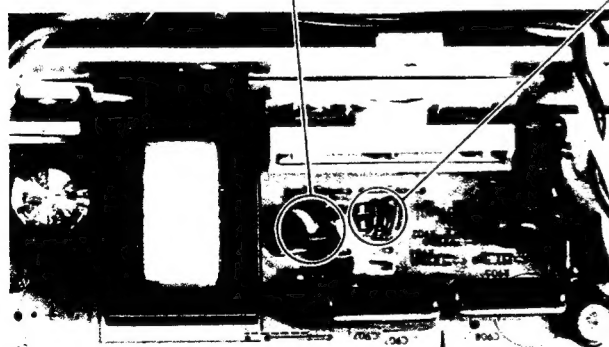
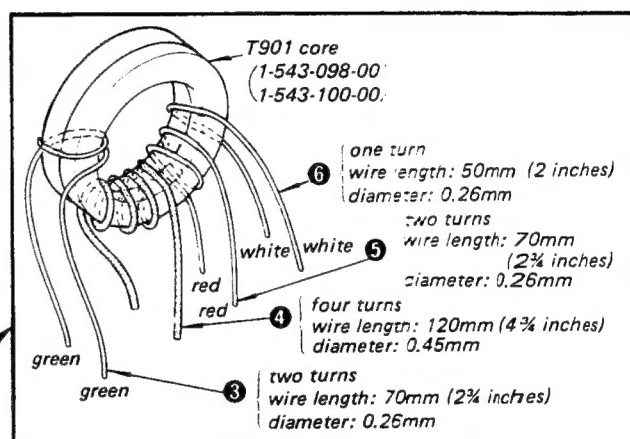
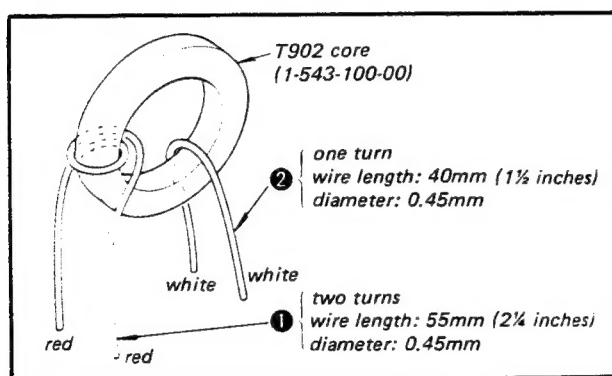
As the repair parts, T901 and T902 are formed by only iron core. Thus, if the coils are defective, arrange a new transformers as shown below. Note that the lead lengths must be exact. Also wind the coil carefully.

## 2. INVERTER CIRCUIT TRANSISTOR REPLACEMENT

When any of the inverter transistors (Q903, Q904) is broken, replace their transistors together.

A pair of transistors with the same rank is provided for service field.

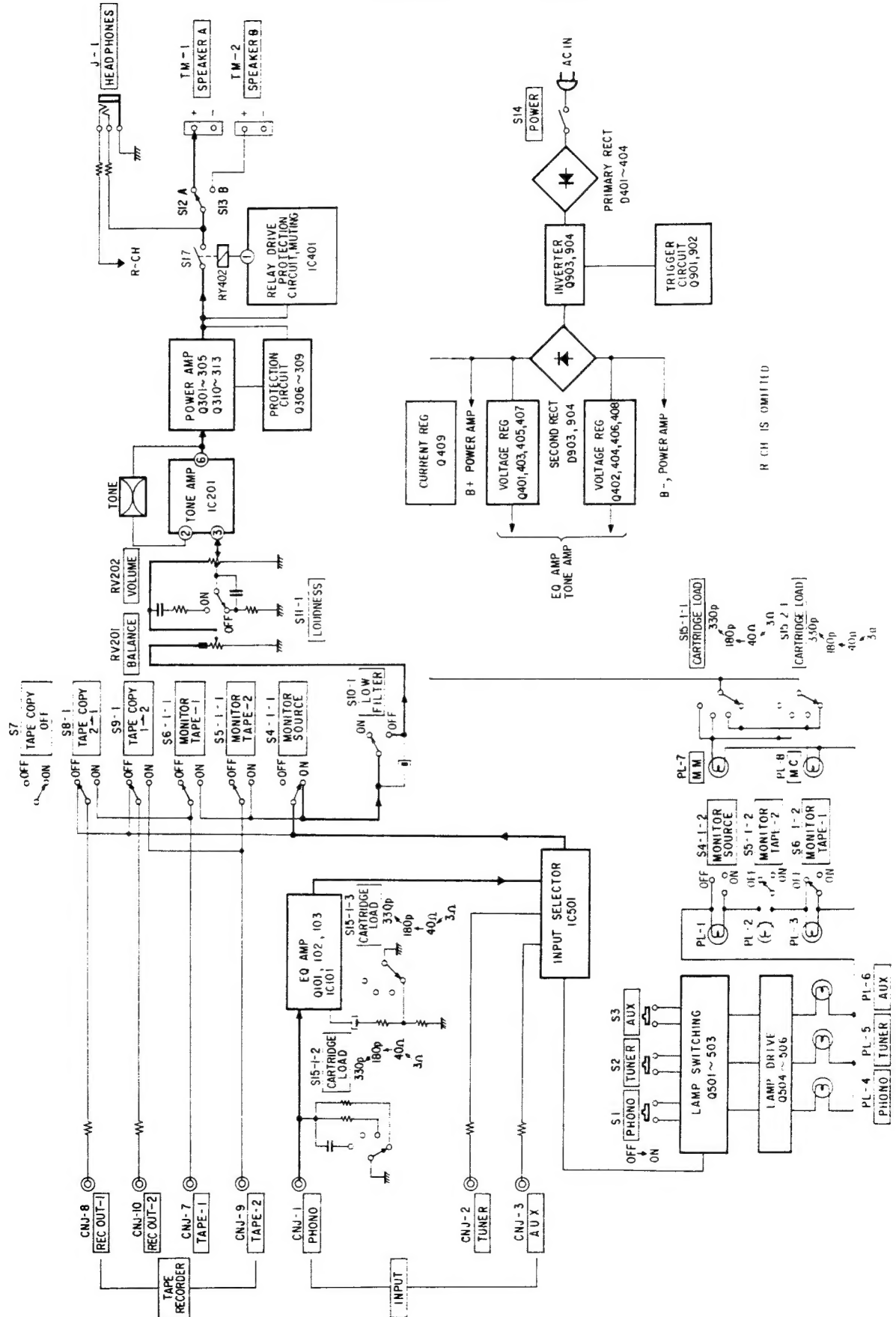
Ref. No.	Part No.	Description
Q903, 904	X-4863-506-1	Transistor Ass'y, service



pulse power  
supply board

Fig. 1

# SECTION 1 BLOCK DIAGRAM

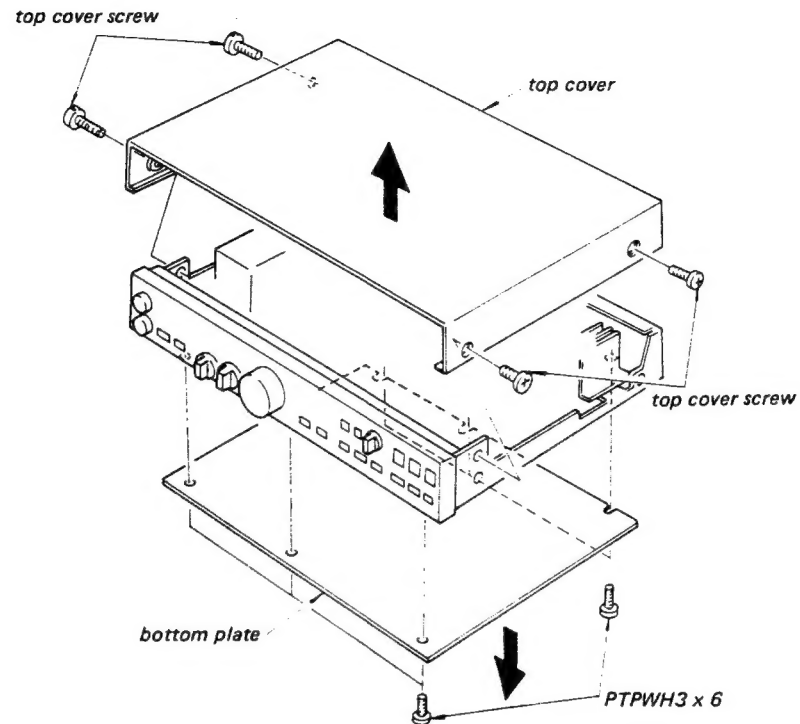


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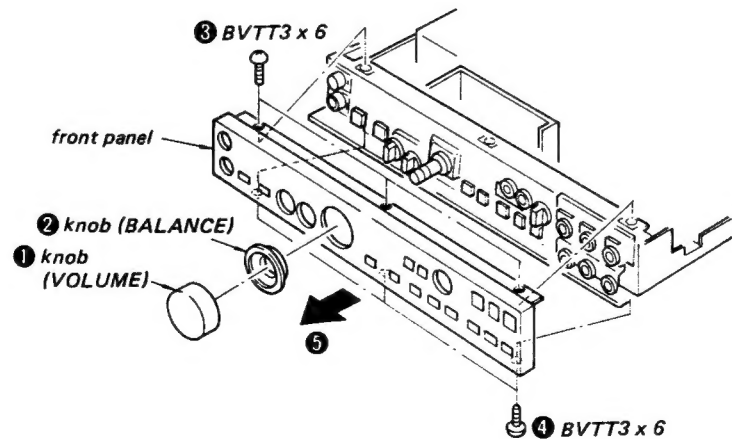
## SECTION 2 DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

### TOP COVER AND BOTTOM PLATE REMOVAL



### FRONT PANEL REMOVAL



Under the condition shown below, the circuit boards can be checked except for the pulse power supply board.

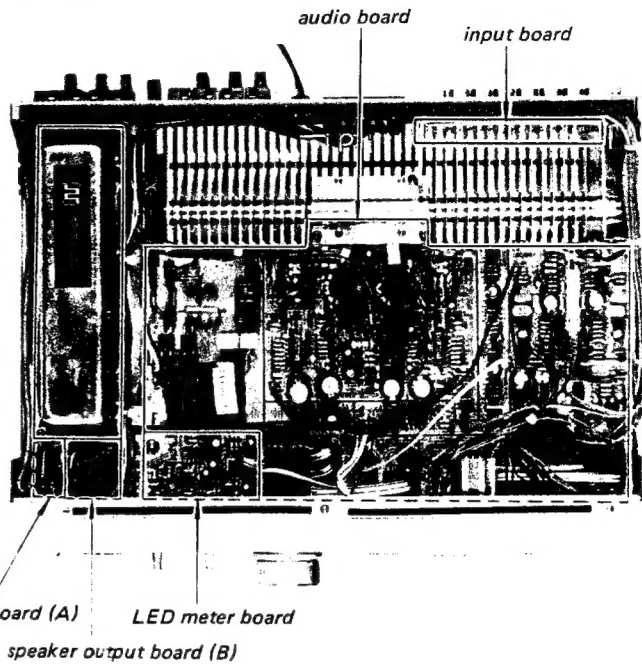
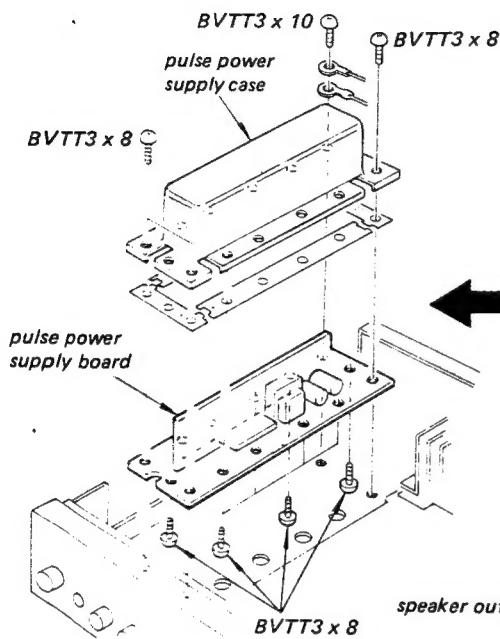
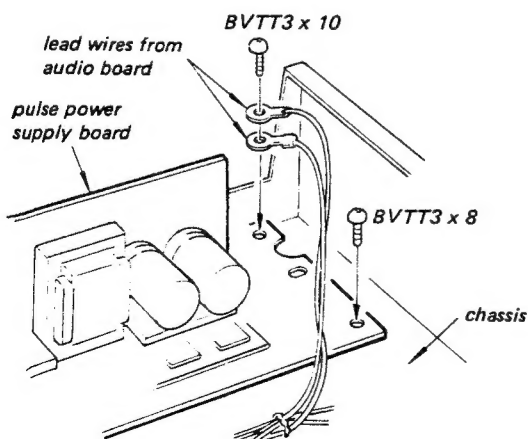


Photo : US, Canadian model

## PULSE POWER SUPPLY BOARD REPAIRING

When checking the pulse power supply board out of the pulse power supply case, use the two lead wires to connect the ground pattern of circuit board with the chassis as shown below.



— With pulse power supply board grounded —

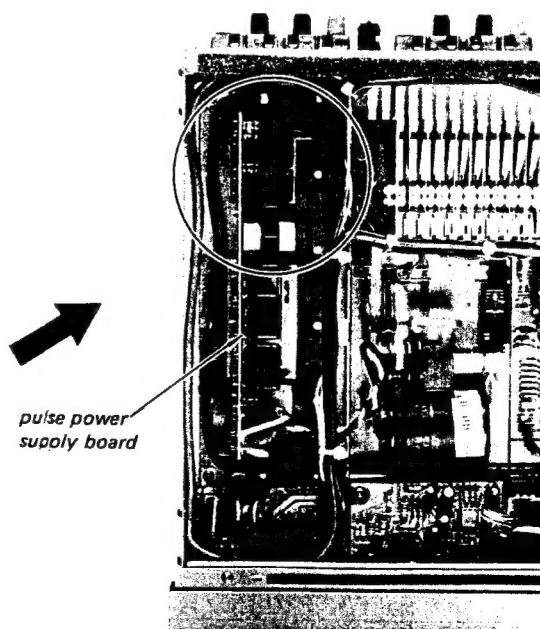


Photo : US, Canadian model

## SECTION 3 ADJUSTMENTS

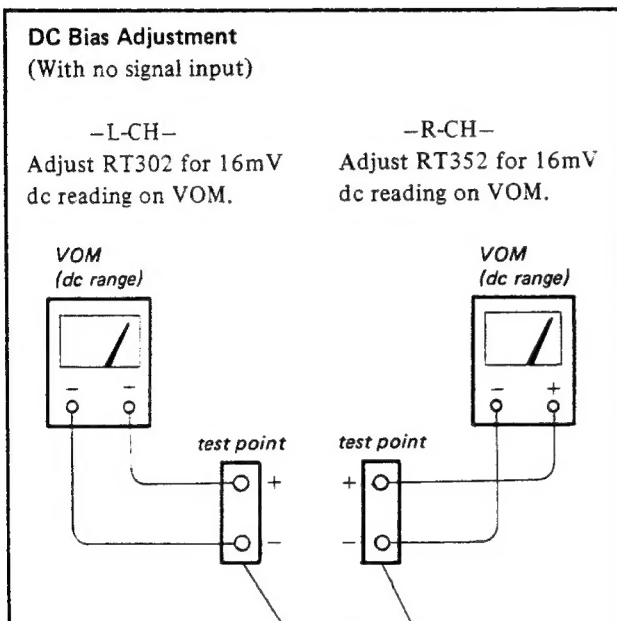
### Note:

1. DC bias and DC balance adjustments should be made several minutes later after the POWER switch is turned on (POWER ON.).
2. Make DC bias adjustment first.
3. Repeat DC bias and DC balance adjustments two or three times.
4. After replacing the power transistors, DC bias and DC balance adjustments should be made.

### DC Bias Adjustment (With no signal input)

—L-CH—  
Adjust RT302 for 16mV  
dc reading on VOM.

—R-CH—  
Adjust RT352 for 16mV  
dc reading on VOM.



### DC Balance Adjustment

#### Procedure:

Adjust RT301 (L-CH) and RT351 (R-CH) for 0V readings with no signal input.

#### Adjustment Location:

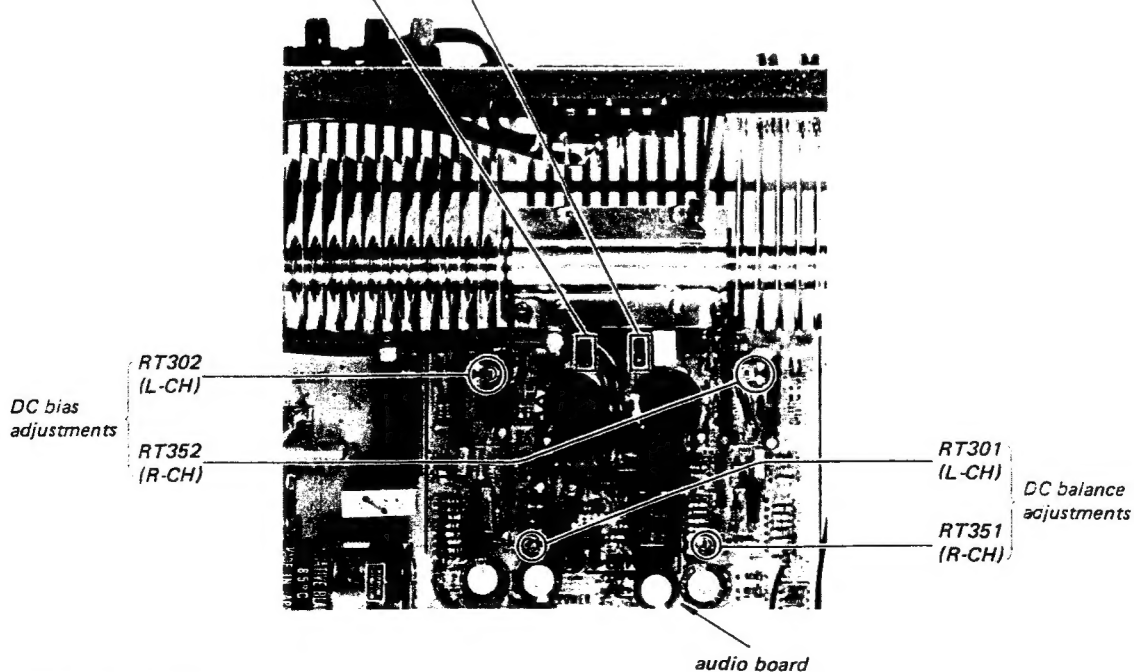
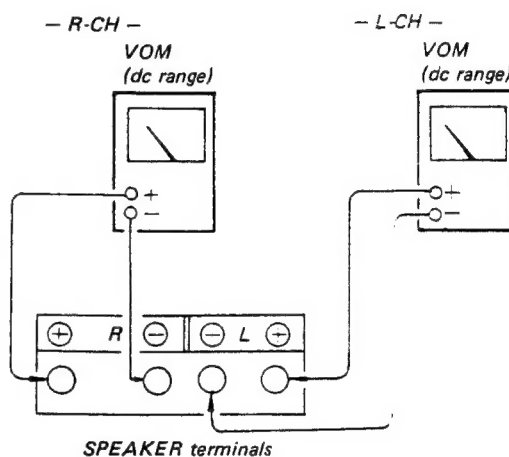


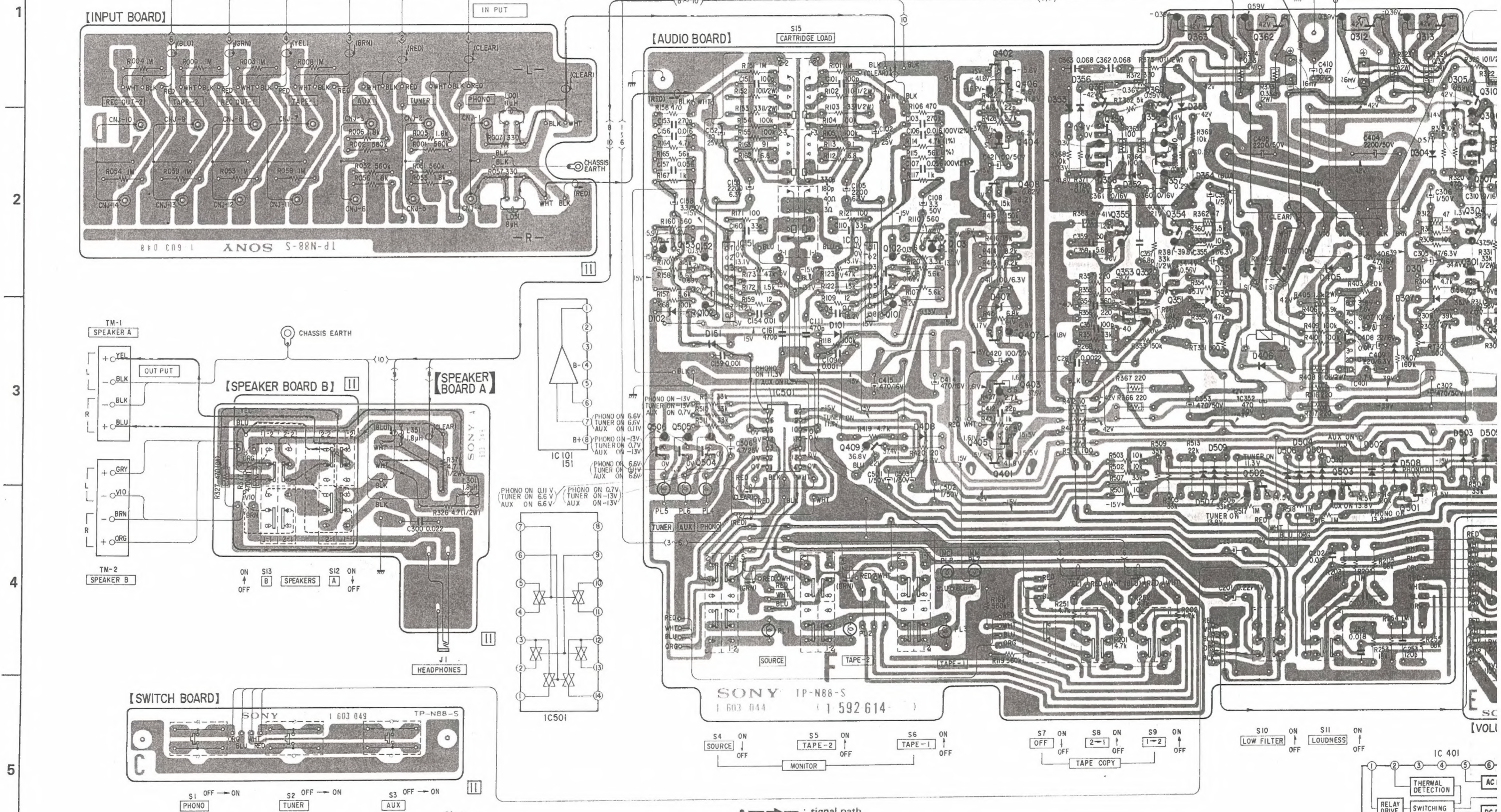
Photo : US, Canadian model



## 4-1. MOUNTING DIAGRAM

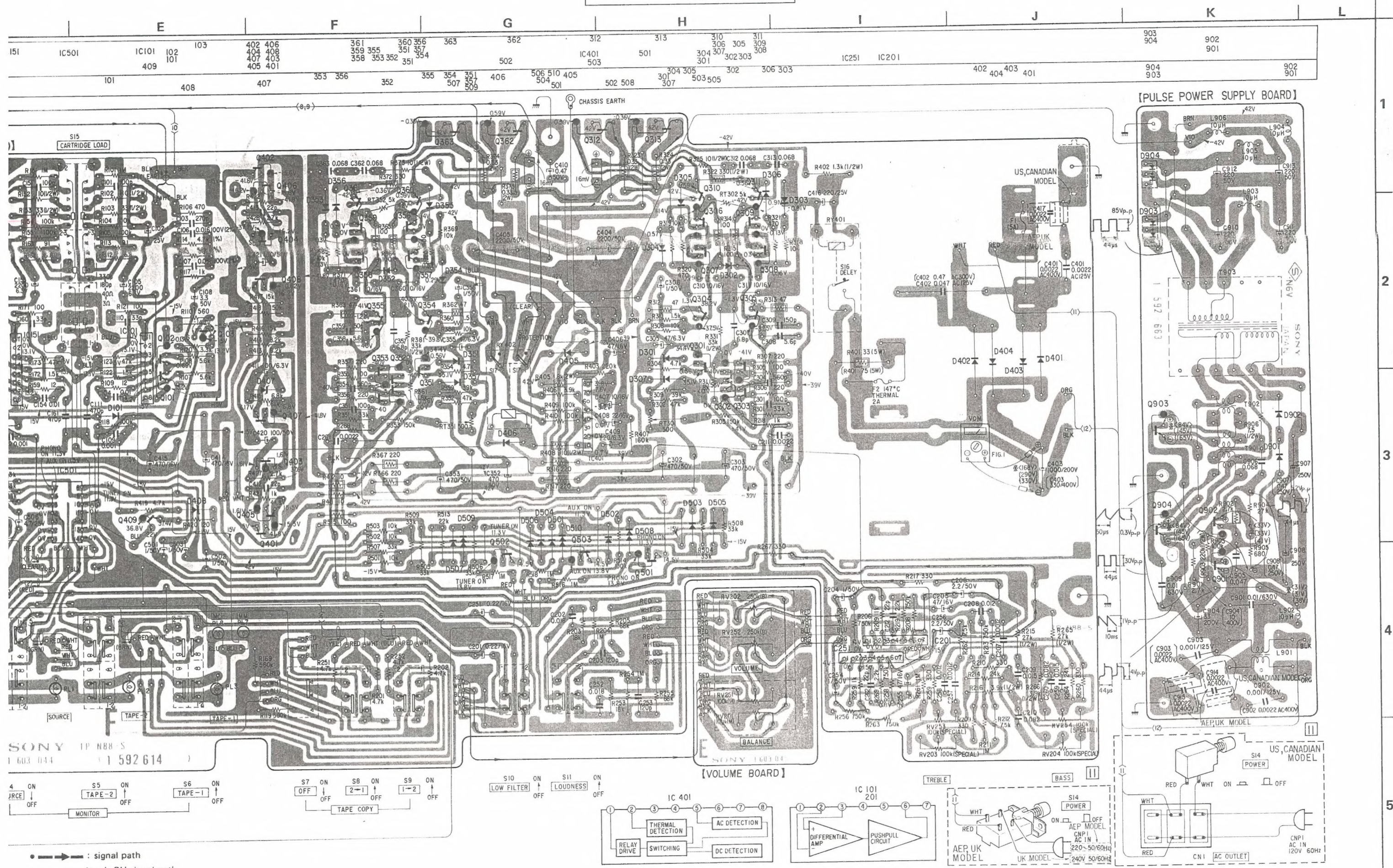
Replacement Semiconductors : See pages 14.

Q	153	152	IC151	IC501	IC101	102	103	402	406	361	360	356	363	362	312	313	311
IC	506	102				101		404	408	359	355	351	357				
	505				409			407	403	358	353	352	351	502	IC401	501	304
	504							405	401						503	301	301
D	102	151		101		408		407		353	356	355	354	351	406	506	510
												507	509			504	405
																501	304
																502	508
																301	305
																307	503
																	505



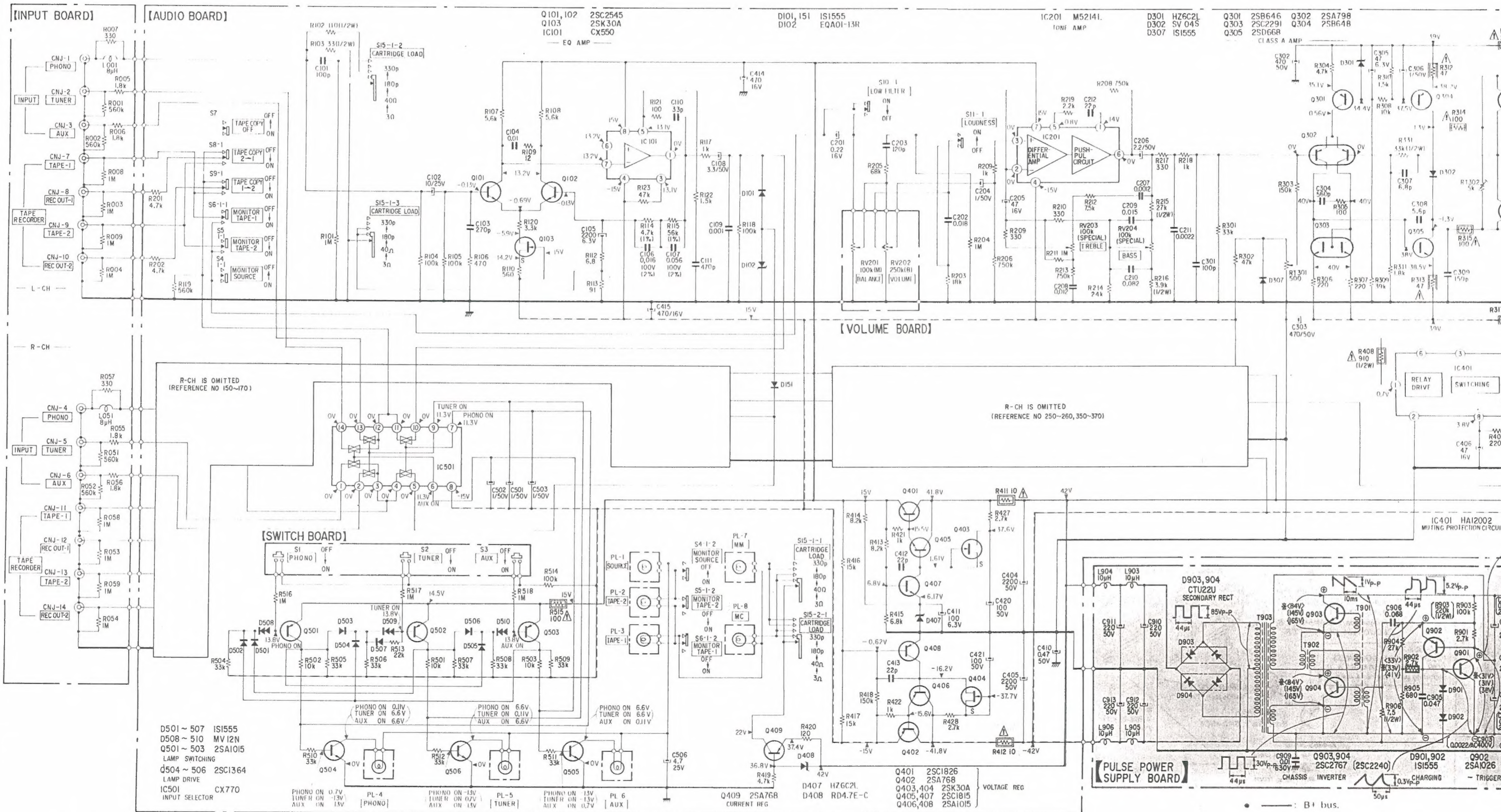



**TA-F45      TA-F45**





#### 4-2. SCHEMATIC DIAGRAM




**Note:** Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

**Note:** The components identified by shading and mark  are critical for safety. Replace only with part number specified.

**Note:**

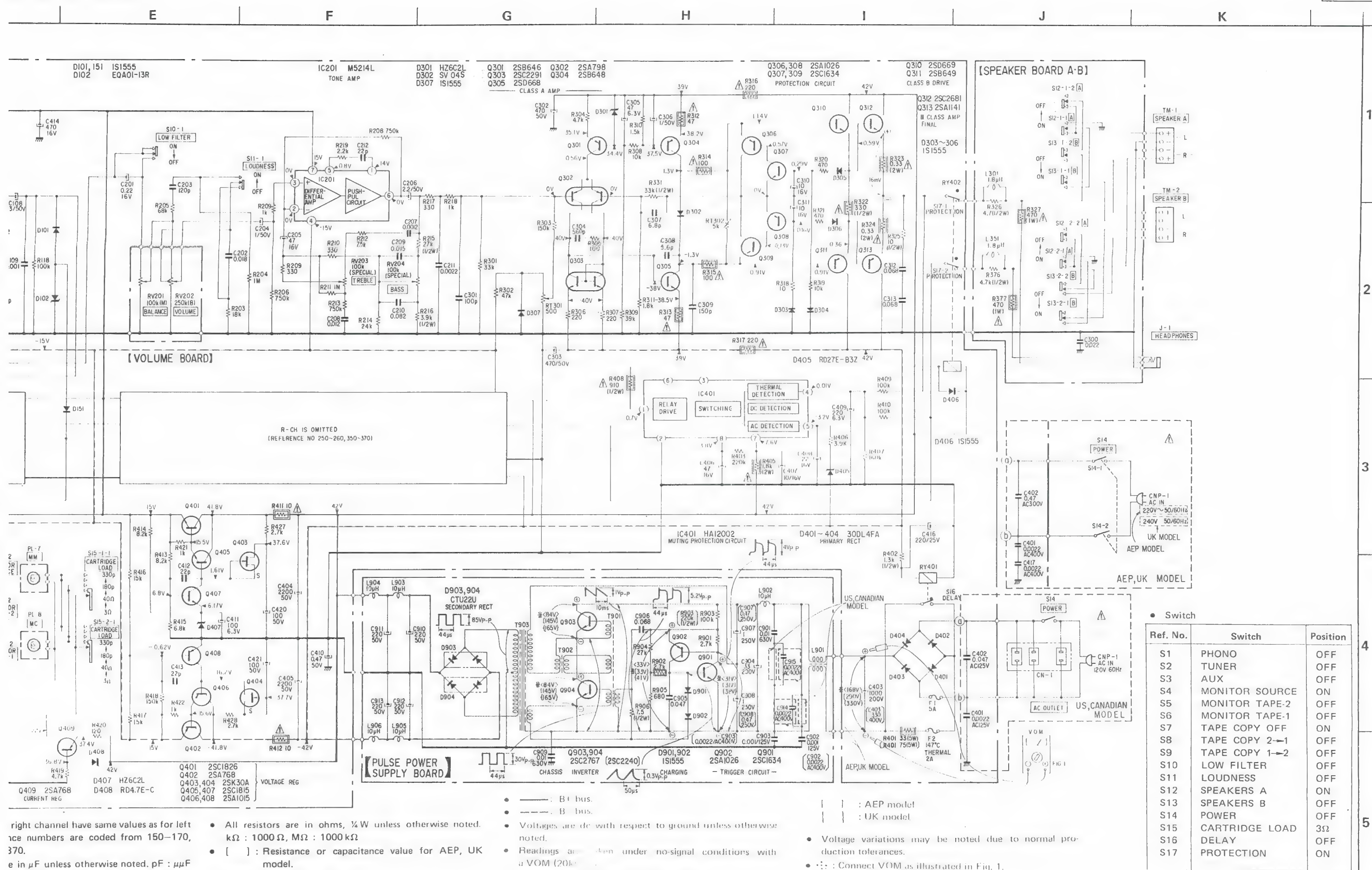
- Components for right channel have same values as for left channel. Reference numbers are coded from 150–170, 250–260, 350–370.
- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF} : \mu\text{F}$  50WV or less are not indicated except for electrolytics and tantalums.

- All resistors are in ohms, ¼ W unless otherwise noted.  
kΩ : 1000 Ω, MΩ : 1000 kΩ
- [ ] : Resistance or capacitance value for AEP, UK model.
-  : nonflammable resistor.


- ———: B+ bus.
- - - - - : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal condition a VOM (20k $\Omega$ /V).

no mark : US, Canadian, AEP, UK model  
 < > : US, Canadian model






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- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (20k  $\Omega$ ).

- Voltage variations may be noted due to normal production tolerances.
-  Connect VOM as illustrated in Fig. 1.

Ref. No.	Switch	Position
S1	PHONO	OFF
S2	TUNER	OFF
S3	AUX	OFF
S4	MONITOR SOURCE	ON
S5	MONITOR TAPE-2	OFF
S6	MONITOR TAPE-1	OFF
S7	TAPE COPY OFF	ON
S8	TAPE COPY 2→1	OFF
S9	TAPE COPY 1→2	OFF
S10	LOW FILTER	OFF
S11	LOUDNESS	OFF
S12	SPEAKERS A	ON
S13	SPEAKERS B	OFF
S14	POWER	OFF
S15	CARTRIDGE LOAD	3Ω
S16	DELAY	OFF
S17	PROTECTION	ON



4.2. SCHEMATIC DIAGRAM

[INPUT BOARD]

[AUDIO BOARD]

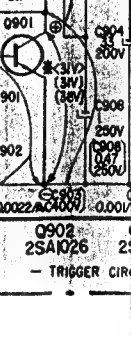
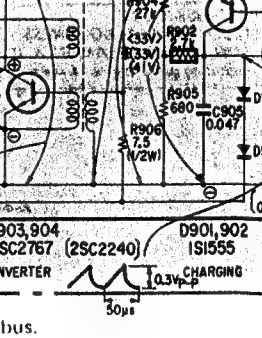
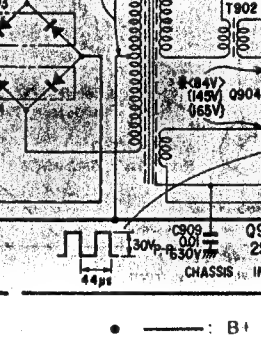
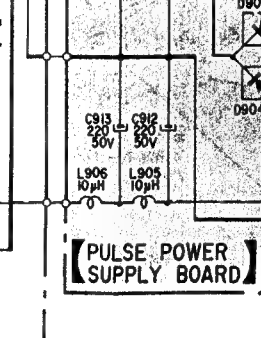
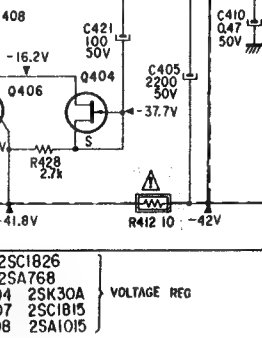
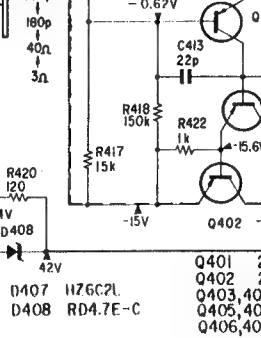
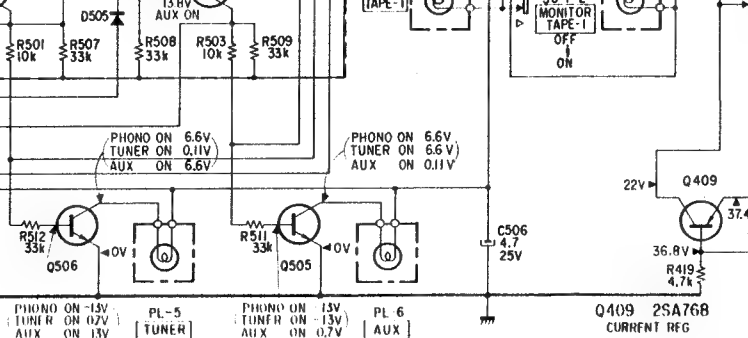
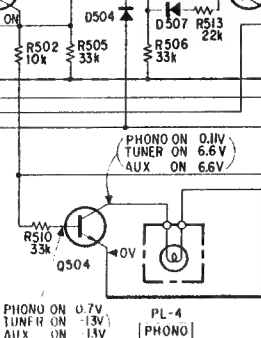
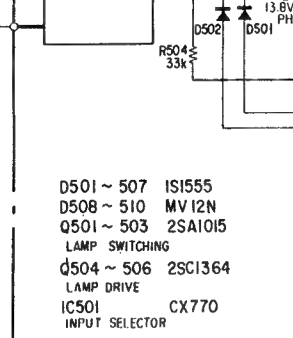
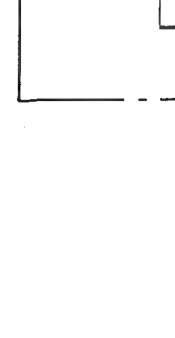
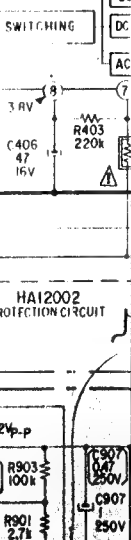
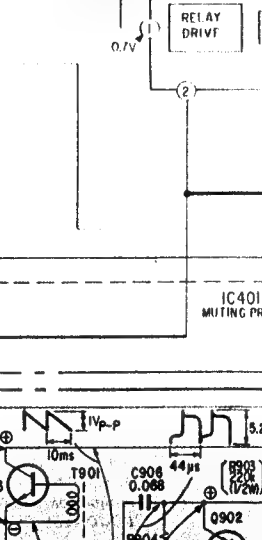
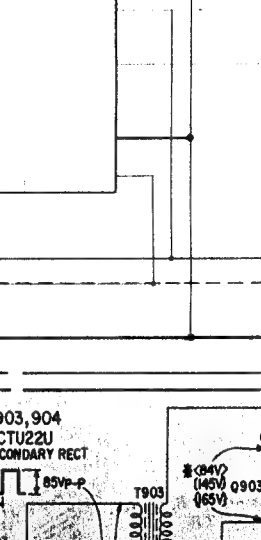
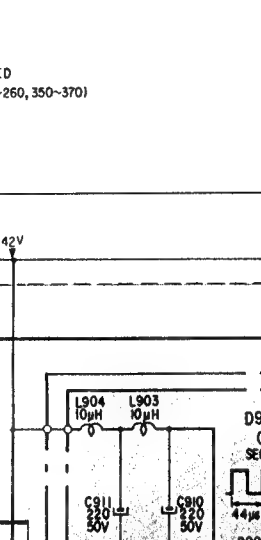
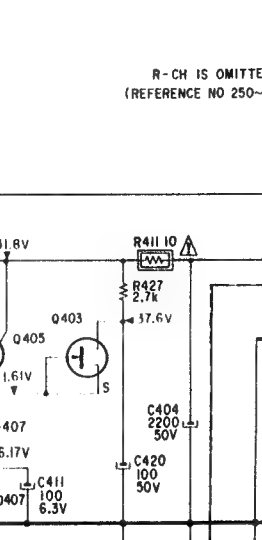
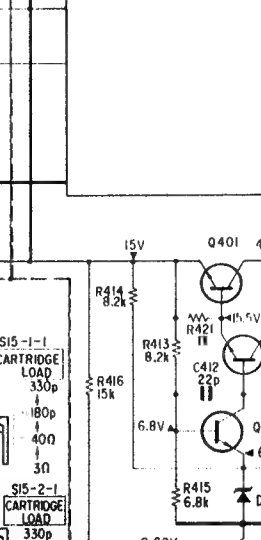
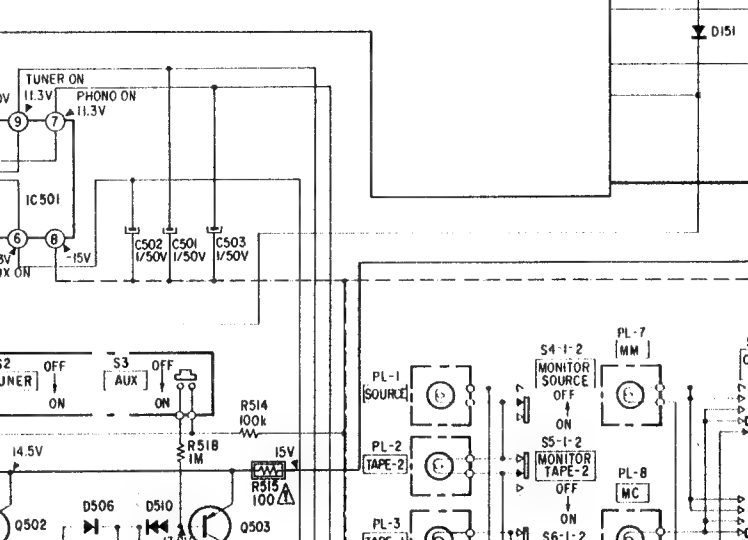
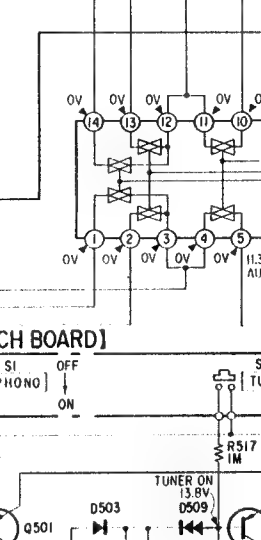
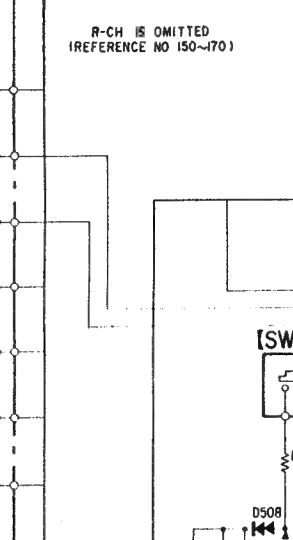
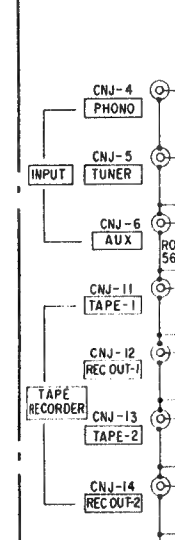
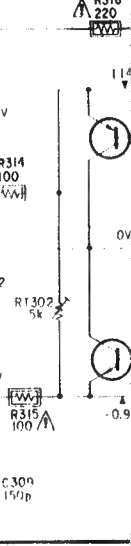
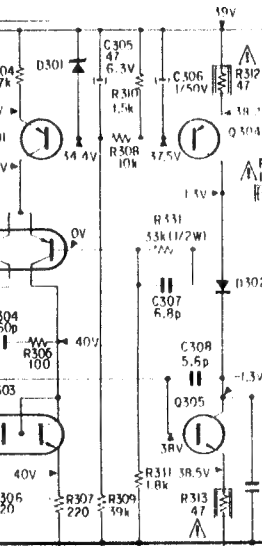
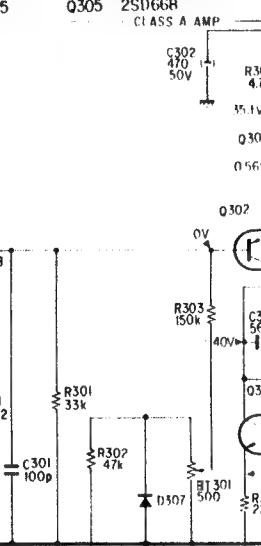
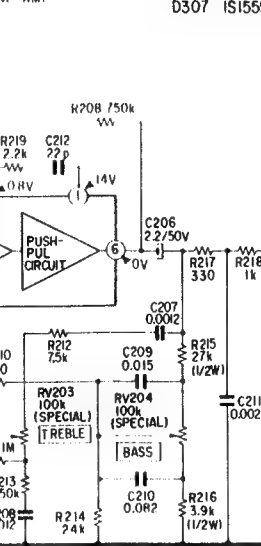
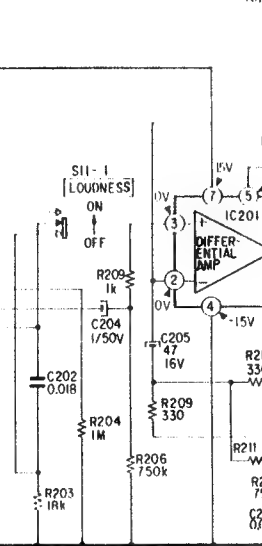
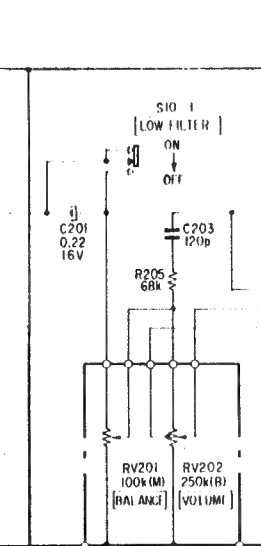
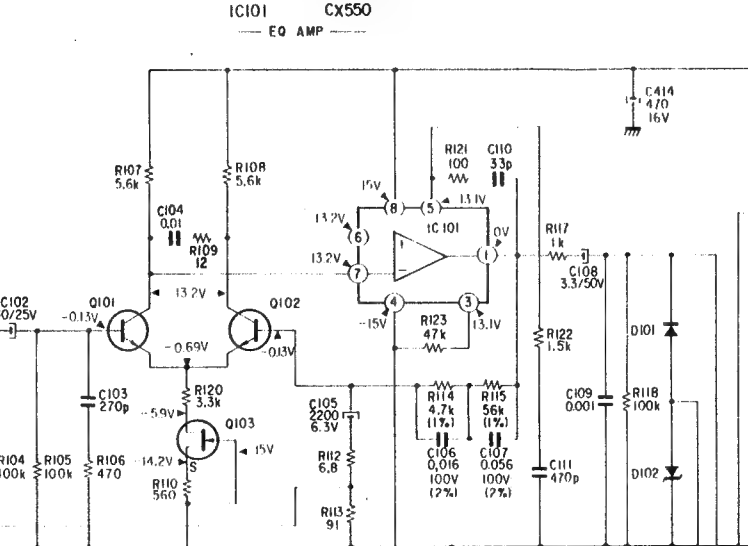
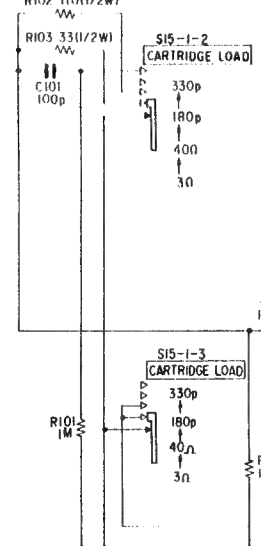
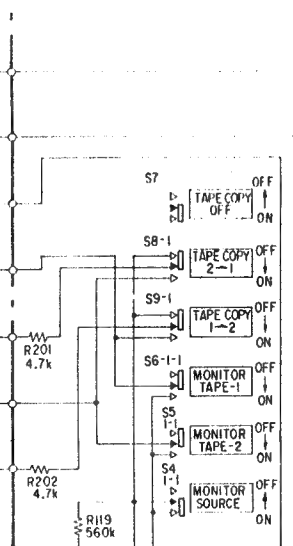
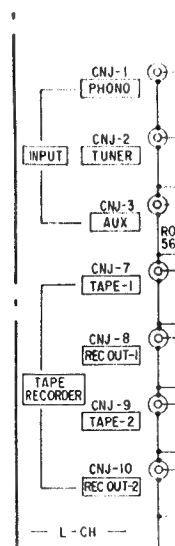
Q101,102 2SC2545  
Q103 2SK30A  
IC101 CX550  
EQ AMP

D101,151 IS1555  
D102 EQA01-13R

IC201 M52141  
10W AMP

D301 HZ6C2L  
D302 SV 045  
D307 IS1555  
CLASS A AMP

Q301 2SB646  
Q303 2SC2291  
Q305 2SD668  
Q302 2SA798  
Q304 2SB648



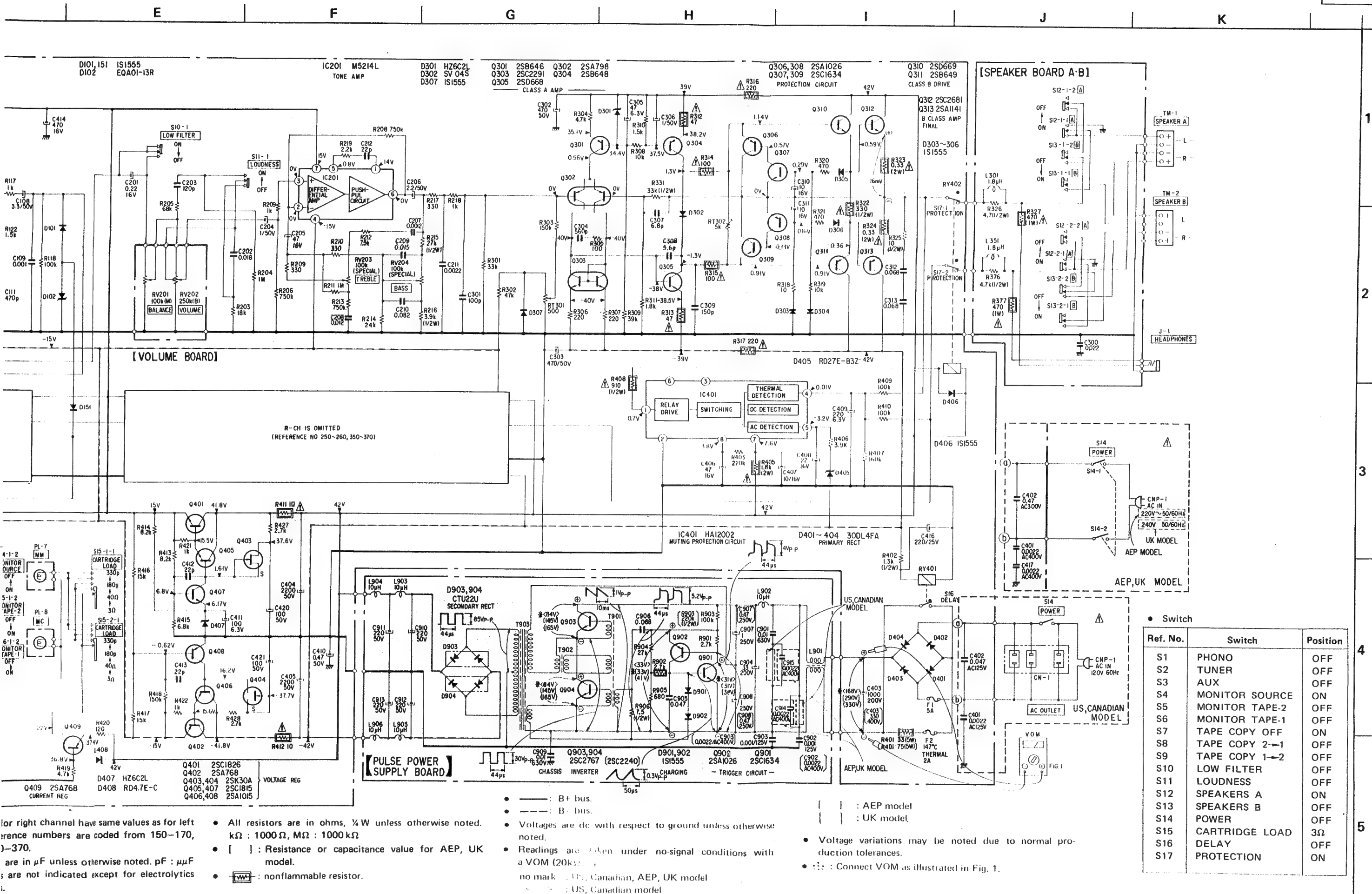
Note: Les composants identifiés par une trame et une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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Note: • Components for right channel have same values as for left channel. Reference numbers are coded from 150-170, 250-260, 350-370.  
• All capacitors are in  $\mu F$  unless otherwise noted.  $pF$  :  $\mu F$  50WV or less are not indicated except for electrolytics and tantalums.

• All resistors are in ohms,  $\frac{1}{4}W$  unless otherwise noted.  $k\Omega$  : 1000  $\Omega$ ,  $M\Omega$  : 1000  $k\Omega$   
• [ ] : Resistance or capacitance value for AEP, UK model.  
• : nonflammable resistor.

• — : B+ bus.  
• - - - : B- bus.  
• Voltages are dc with respect to ground unless otherwise noted.  
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no mark : US, Canadian, AEP, UK model  
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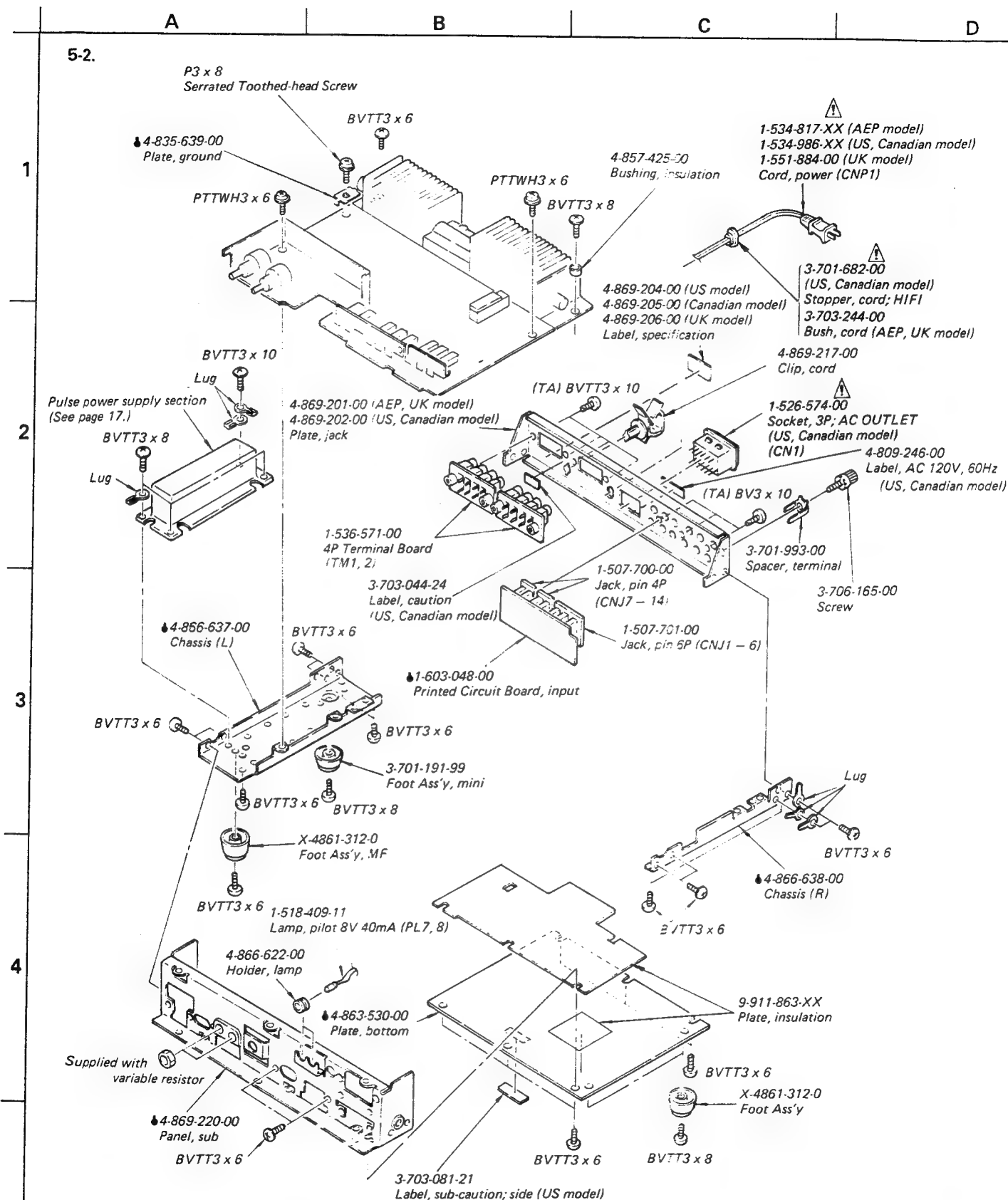
## Replacement Semiconductors


For replacement, use semiconductors except in ( ).


<b>2SA771 (2SA768)</b> 	<b>2SC2291</b> 	<b>M5214L</b> 
<b>2SA798</b> 	<b>2SC2545</b> 	<b>1S1555</b> <b>HZ6C2L</b> <b>RD4.7E (RD4.7E-C)</b> <b>RD27E-B2Z (RD27E-B3Z)</b> 
<b>2SA1027R (2SA1026)</b>  <b>(2SA1015)</b> 	<b>2SC2681</b> <b>2SD668</b> <b>2SD669A (2SD669)</b> 	<b>CTU22U</b> 
<b>2SA1141</b> 	<b>2SC2767</b> 	<b>EQB01-13 (EQA01-13R)</b> 
<b>2SB646A (2SB646)</b> 	<b>2SK30A</b> 	<b>MV12N</b> 
<b>2SB648</b> <b>2SB649A (2SB649)</b> 	<b>CX550</b> 	<b>SV04S</b> 
<b>2SC1364 (2SC1634) (2SC1815)</b> 	<b>CX770</b> 	<b>U05G (30DL4FA)</b> 
<b>2SC1986</b>  <b>(2SC1826)</b> 	<b>HA12002</b> 	



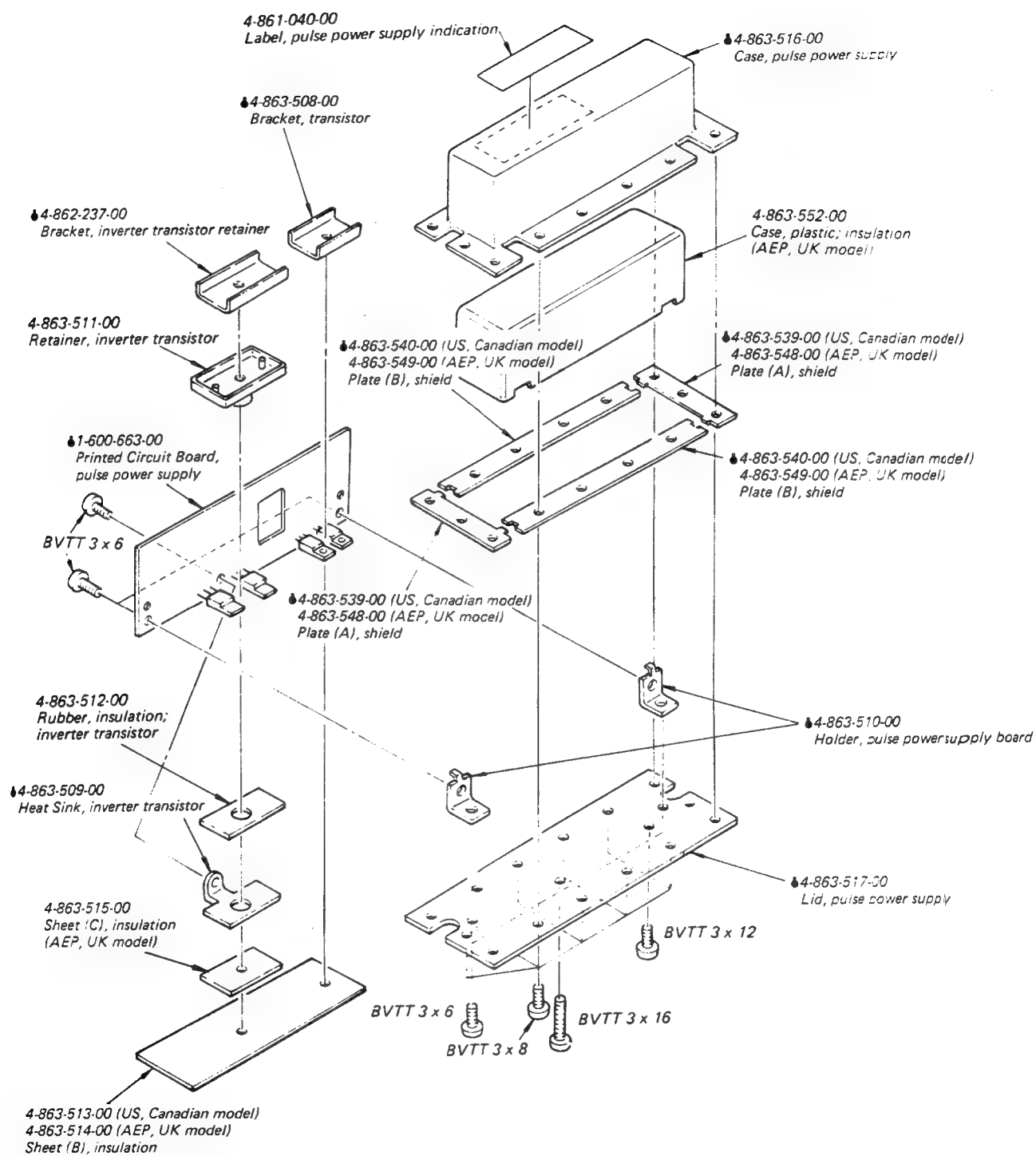
**TA-F45**



**Note:** The components identified by shading and mark  are critical for safety. Replace only with part number specified.

**Note:** Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-3.





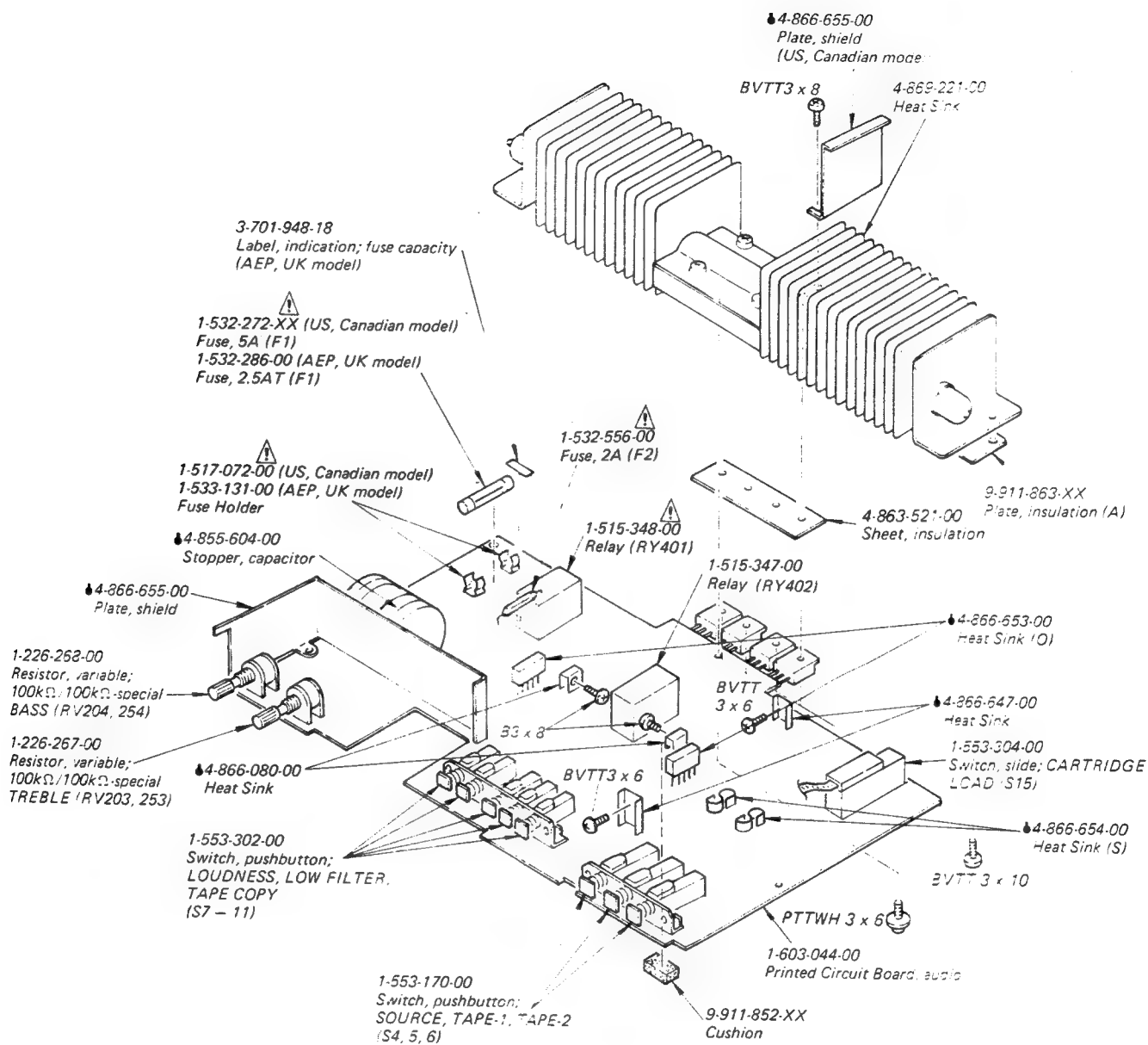
A


B


C

D

5-4.



Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.




## SECTION 6

### ELECTRICAL PARTS LIST

Ref. No.   Part No.   Description

#### SEMICONDUCTORS


##### Transistors

Q101, 151 Q102, 152	8-729-354-52	2SC2545
Q103, 153	8-729-203-04	2SK30A
Q301, 351	8-729-304-62	2SB646A
Q302, 352	8-729-679-82	2SA798
Q303, 353	8-729-629-12	2SC2291
Q304, 354	8-729-364-81	2SB648
Q305, 355	8-729-366-81	2SD668
Q306, 356	8-729-612-77	2SA1027R
Q307, 357	8-729-663-47	2SC1364
Q308, 358	8-729-612-77	2SA1027R
Q309, 359	8-729-663-47	2SC1364
Q310, 360	8-729-306-92	2SD669A
Q311, 361	8-729-304-92	2SB649A
Q312, 362	8-729-168-11	2SC2681
Q313, 363	8-729-114-11	2SA1141
Q401	8-729-308-62	2SC1986
Q402	8-729-377-12	2SA771
Q403, 404	8-729-203-04	2SK30A
Q405	8-729-663-47	2SC1364
Q406	8-729-612-77	2SA1027R
Q407	8-729-663-47	2SC1364
Q408	8-729-612-77	2SA1027R
Q409	8-729-377-12	2SA771
Q501-503	8-729-612-77	2SA1027R
Q504-506	8-729-663-47	2SC1364
Q901	 8-729-663-47	2SC1364
Q902	 8-729-612-77	2SA1027R
Q903, 904	 X-4863-506-1	Transistor Ass'y, service 2SC2767 x 2

##### ICs




IC101, 151	8-759-305-50	CX550
IC201, 251	8-759-652-14	M5214L
IC401	8-759-320-02	HA12002
IC501	8-759-700-00	CX770

- Items marked "X" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

**Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.**










Ref. No.   Part No.   Description


#### Diodes







D101, 151	8-719-815-55	1S1555
D102, 152	8-719-931-13	EQB01-13
D301, 351	8-719-910-68	HZ6C2L
D302, 352	8-719-300-11	SV04S
D303, 353 " " "	8-719-815-55	1S1555
D307, 357		
D401-404	 8-719-911-55	U05G
D405	8-719-127-25	RD27E-B2Z
D406	8-719-815-55	1S1555
D407	8-719-910-68	HZ6C2L
D408	8-719-147-77	RD4.7E
D501-507	8-719-815-55	1S1555
D508-510	8-719-912-00	MV12N
D901, 902	 8-719-815-55	1S1555
D903, 904	 8-719-300-22	CTU22U

#### CAPACITORS

All capacitors are in  $\mu\text{F}$  unless otherwise noted.  
50WV or less are not indicated except for electrolytics and tantalums. pF :  $\mu\text{F}$














C401	 1-130-197-00	0.0022	125V	ceramic (US, Canadian model)
C401, 417	 1-161-734-00	0.0022	400V	ceramic (AEP, UK model)
C402	 1-130-234-00	0.047	125V	film (US, Canadian model)
C402	 1-130-342-00	0.47	300V	film (AEP, UK model)
C403	 1-125-222-00	330	400V	electrolytic (AEP, UK model)
C403	 1-125-223-00	1000	200V	electrolytic (US, Canadian model)
C901, 909	 1-130-141-00	0.01	630V	film
C902, 903	 1-161-516-00	0.001	125V	ceramic (US, Canadian model)
C902, 903 C914, 915	 1-161-734-00	0.0022	400V	ceramic (AEP, UK model)


**Note: Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.**








Ref. No.	Part No.	Description
C904	 A1-123-290-00	10 400V electrolytic (AEP, UK model)
C904	 A1-123-565-00	33 200V electrolytic (US, Canadian model)
C905	 A1-108-246-00	0.047 50V mylar
C907, 908	 A1-130-356-00	0.47 250V film (AEP, UK model)
C907, 908	 A1-130-357-00	1 250V film (US, Canadian model)
C910-913	 A1-123-361-00	220 50V electrolytic

## RESISTORS

All resistors are in ohms. Common 1/4W carbon resistors are omitted. Refer to the list on the last page for their part numbers.  
k $\Omega$  : 1000 $\Omega$ , M $\Omega$  : 1000k $\Omega$

R312, 362 R313, 363	 A1-247-099-00	47 1/4W carbon (nonflammable)
R314, 364 R315, 365	 A1-247-107-00	100 1/4W carbon (nonflammable)
R316, 366 R317, 367	 A1-247-115-00	220 1/4W carbon (nonflammable)
R322, 372	 A1-247-288-00	330 1/4W carbon (nonflammable)
R323, 373 R324, 374	 A1-217-152-11	0.33 2W wirewound
R327, 377	 A1-213-139-00	470 1W metal oxide (nonflammable)
R401	 A1-205-598-00	33 5W wirewound (US, Canadian model)
R401	 A1-205-599-00	75 5W wirewound (AEP, UK model)
R405	 A1-206-670-00	1.8k 2W metal oxide (nonflammable)
R408	 A1-247-239-00	910 1/2W carbon (nonflammable)
R411, 412	 A1-247-083-00	10 1/4W carbon (nonflammable)
R515	 A1-247-107-00	100 1/4W carbon (nonflammable)
R901	 A1-246-483-15	2.7k 1/4W carbon











Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.


Ref. No.	Part No.	Description
R902	 A1-247-141-00	2.7k 1/4W carbon (nonflammable)
R903	 A1-244-521-15	100k 1/4W carbon (US, Canadian model)
R903	 A1-244-929-00	220k 1/4W carbon (AEP, UK model)
R904	 A1-246-507-15	27k 1/4W carbon
R905	 A1-246-469-15	680 1/4W carbon
R906	 A1-244-821-00	6.8 1/4W carbon (US, Canadian model)
R906	 A1-244-822-00	7.5 1/4W carbon (AEP, UK model)

RT301,351	1-226-232-00	500-B, adjustable; dc balance
RT302,352	1-226-235-00	5k-B, adjustable; dc bias











RV201,251 RV202,252	1-226-834-00	100kx2-NM/250kx2-B, variable; BALANCE, VOLUME
RV203, 253	1-226-267-00	100k/100k-special, variable; TREBLE
RV204, 254	1-226-268-00	100k/100k-special, variable; BASS

## MISCELLANEOUS








CN1	 A1-526-574-00	AC-outlet, 3P (US, Canadian model)
CNJ1-6	1-507-701-00	Jack, pin 6P INPUT
CNJ7-14	1-507-700-00	Jack, pin 4P TAPE RECORDER
CNP1	 A1-534-817-XX	Cord, power (AEP model)
CNP1	 A1-534-986-XX	Cord, power (US, Canadian model)
CNP1	 A1-551-884-00	Cord, power (UK model)
F1	 A1-532-272-XX	Fuse, 5A (US, Canadian model)
F1	 A1-532-286-00	Fuse, 2.5AT (AEP, UK model)
F2	 A1-532-556-00	Fuse, 147°C 2A
J1	1-507-669-00	Jack, HEADPHONES
L001, 051	1-407-519-00	Microinductor, 8 $\mu$ H
L301, 351	1-420-872-00	Coil, air-core 1.8 $\mu$ H
L901	 A1-421-328-11	Coil, choke (Line Filter) (US, Canadian model)
L901	 A1-421-340-00	Coil, choke (Line Filter) (AEP, UK model)
L902-906	 A1-421-329-00	Coil, choke 10 $\mu$ H
PL1-6	1-518-409-21	Lamp, pilot 8V 40mA


Note: Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



<i>Ref. No.</i>	<i>Part No.</i>	<i>Description</i>
PL7, 8	1-518-409-11	Lamp, pilot 8V 40mA
RY401	 1-515-348-00	Relay
RY402	1-515-347-00	Relay
S1-3	1-552-539-00	Switch, keyboard; PHONO, TUNER, AUX
S4-6	1-553-170-00	Switch, pushbutton; SOURCE, TAPE-2, TAPE-1
S7-11	1-553-302-00	Switch, pushbutton; LOUDNESS, LOW FILTER, TAPE COPY
S12, 13	1-553-167-00	Switch, pushbutton; SPEAKERS A, B
S14	 1-553-319-00	Switch, pushbutton; POWER (US, Canadian model)
S14-1-2	 1-553-447-00	Switch, pushbutton; POWER (AEP, UK model)
S15	1-553-303-00	Switch, rotary slide; CARTRIDGE LOAD
S15	1-553-304-00	Switch, slide; CARTRIDGE LOAD
T901	 1-543-098-00	Core
T901, 902	 1-543-100-00	Core
T903	 1-446-363-00	Transformer, converter (US, Canadian model)
T903	 1-446-364-00	Transformer, converter (AEP, UK model)
TM1, 2	1-536-571-00	4P Terminal Board, SPEAKER A, B
	 1-508-803-13	U Type Base Post
	 1-517-072-00	Fuse Holder (US, Canadian model)
	 1-533-131-00	Fuse Holder (AEP, UK model)

#### PRINTED CIRCUIT BOARDS


 1-600-663-00	Pulse Power Supply
 1-603-044-00	Audio
 1-603-045-00	Volume
 1-603-046-00	Speaker (A)
 1-603-047-00	Speaker (B)
 1-603-048-00	Input
 1-603-049-00	Switch

**Note:** The components identified by shading and mark  are critical for safety. Replace only with part number specified.

<i>Ref. No.</i>	<i>Part No.</i>	<i>Description</i>
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#### ACCESSORIES AND PACKING MATERIALS

<i>Part No.</i>	<i>Description</i>
3-701-630-00	Bag, plastic (for instruction manual)
3-783-202-11	Manual, instruction (AEP, UK model)
3-783-202-21	Manual, instruction (US, Canadian model)
3-794-479-31	Leaflet in French (Canadian model)
4-863-543-00	Cushion
4-866-723-00	Bag, plastic (for amplifier)
4-869-227-00	Carton

**Note:** Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le même numéro spécifié.

## ELECTROLYTIC CAPACITORS

CAP. (μF)	RATING → : Use the high voltage rated one.					
	6.3 VOLT.	10 VOLT.	16 VOLT.	25 VOLT.	35 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.47	→	→	→	→	→	1-121-726-00
1.0	→	→	→	→	→	1-121-391-00
2.2	→	→	→	→	→	1-121-450-00
3.3	→	→	→	1-121-392-00	→	1-121-393-00
4.7	→	→	→	1-121-395-00	→	1-121-396-00
10	→	→	1-121-651-00	1-121-398-00	→	1-121-738-00
22	→	→	1-121-479-00	1-121-480-00	1-121-662-00	1-121-152-00
33	→	→	1-121-403-00	1-121-404-00	1-121-652-00	1-121-405-00
47	→	1-121-353-00	1-121-409-00	1-121-410-00	1-121-653-00	1-121-411-00
100	→	1-121-414-00	1-121-415-00	1-121-416-00	1-121-357-00	1-121-417-00
220	1-121-419-00	1-121-420-00	1-121-421-00	1-121-422-00	1-121-267-00	1-121-423-00
330	1-121-751-00	1-121-405-00	1-121-521-00	1-121-654-00	1-121-655-00	1-121-656-00
470	1-121-424-00	1-121-425-00	1-121-426-00	1-121-733-00	1-121-361-00	1-121-810-00
1000	→	1-121-736-00	1-121-245-00	1-121-657-00	1-121-388-00	1-123-061-00
2200	1-121-658-00	1-121-559-00	1-121-660-00	1-123-067-00	1-121-954-00	→
3300	1-121-661-00	1-123-075-00	1-123-071-00	→	→	→

CAP. (μF)	100 VOLT.	160 VOLT.	250 VOLT.	350 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.47	→	→	→	→
1.0	1-123-249-00	1-123-252-00	1-123-003-00	1-121-168-00
2.2	1-123-250-00	1-123-026-00	→	1-123-028-00
3.3	1-121-995-00	→	1-123-004-00	1-123-006-00
4.7	1-123-255-00	1-121-246-00	1-121-759-00	1-123-007-00
10	1-121-126-00	1-121-999-00	1-123-254-00	1-123-008-00
22	1-121-996-00	1-123-253-00	1-123-005-00	1-123-022-00
33	1-121-997-00	1-121-757-00	→	→
47	1-123-251-00	1-121-919-00	→	→
100	1-123-084-00	→	→	→

## CERAMIC CAPACITORS

RATING							
CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.
	PART No.		PART No.		PART No.		PART No.
0.5	1-101-837-00	22	1-102-959-00	150	1-101-561-00	0.001	1-102-074-00
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.001	1-102-118-00
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015	1-102-119-00
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0015	1-102-120-00
2.0	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022	1-102-121-00
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027	1-102-122-00
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033	1-102-123-00
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0033	1-102-124-00
6	1-102-943-00	47	1-101-580-00	330	1-102-820-00	0.0047	1-102-125-00
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056	1-102-126-00
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0056	1-102-127-00
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0068	1-102-128-00
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01	1-102-129-00
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.01	1-101-005-00
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.017	1-101-009-00
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00	→	→
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00	→	→
16	1-102-952-00	110	1-102-815-00	→	→	→	→
18	1-102-953-00	120	1-102-816-00	→	→	→	→
20	1-102-958-00	130	1-101-081-00	→	→	→	→

0.001μF = 1,000pF

## CERAMIC (SEMICONDUCTOR) CAPACITORS

CAP. (μF)	RATING → : Use the high voltage rated one.					
	25 VOLT.	50 VOLT.	CAP. (μF)	25 VOLT.	50 VOLT.	
	PART No.	PART No.		PART No.	PART No.	
0.001	→	1-161-039-00	0.018	1-161-016-00	1-161-054-00	
0.0012	→	1-161-040-00	0.022	1-161-017-00	1-161-055-00	
0.0015	→	1-161-041-00	0.027	1-161-018-00	1-161-056-00	
0.0018	→	1-161-042-00	0.033	1-161-019-00	1-161-057-00	
0.0022	→	1-161-043-00	0.039	1-161-010-00	1-161-058-00	
0.0027	→	1-161-044-00	0.047	1-161-021-00	1-161-059-00	
0.0033	→	1-161-045-00	0.056	→	1-161-060-00	
0.0039	→	1-161-046-00	0.068	→	1-161-061-00	
0.0047	→	1-161-047-00	0.082	1-161-024-00	1-161-062-00	
0.0056	→	1-161-048-00	0.1	1-161-025-00	1-161-063-00	
0.0068	→	1-161-049-00	→	→	→	
0.0082	1-161-012-00	1-161-050-00	→	→	→	
0.01	1-161-013-00	1-161-051-00	→	→	→	
0.012	→	1-161-052-00	→	→	→	
0.015	1-161-015-00	1-161-053-00	→	→	→	

## MYLAR CAPACITORS

RATING											
CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.	CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.	CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.
PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00
0.0022	1-108-230-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	-	-
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	-	-
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	-	-
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	-	-
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00				
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00				
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00				



## TANTALUM CAPACITORS

RATING							
→ Use the high voltage rated one.							
CAP. (μF)	3.15 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	25 VOLT.	35 VOLT.
PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.01					→	→	1-131-396-00
0.015					→	→	1-131-397-00
0.022					→	→	1-131-398-00
0.033					→	→	1-131-399-00
0.047					→	→	1-131-400-00
0.068					→	→	1-131-401-00
0.1					→	→	1-131-402-00
0.15					→	→	1-131-403-00
0.22					→	→	1-131-404-00
0.33					→	→	1-131-405-00
0.47					1-131-412-00	→	1-131-406-00
0.68				1-131-415-00	→	1-131-410-00	1-131-407-00
1.0			1-131-418-00		1-131-413-00	→	1-131-408-00
1.5		1-131-421-00		1-131-416-00	→	1-131-411-00	1-131-348-00
2.2	1-131-424-00		1-131-419-00		1-131-414-00	1-131-355-00	1-131-349-00
3.3		1-131-422-00		1-131-417-00	1-131-362-00	1-131-356-00	1-131-350-00
4.7	1-131-425-00		1-131-420-00	1-131-369-00	1-131-363-00	1-131-357-00	1-131-351-00
6.8		1-131-423-00	1-131-376-00	1-131-370-00	1-131-364-00	1-131-358-00	1-131-352-00
10	1-131-426-00	1-131-383-00	1-131-377-00	1-131-371-00	1-131-365-00	1-131-359-00	1-131-353-00
15	1-131-390-00	1-131-384-00	1-131-378-00	1-131-372-00	1-131-366-00	1-131-360-00	-
22	1-131-391-00	1-131-385-00	1-131-379-00	1-131-373-00	1-131-367-00		
33	1-131-392-00	1-131-386-00	1-131-380-00	1-131-374-00			
47	1-131-393-00	1-131-387-00	1-131-381-00				
68	1-131-394-00	1-131-388-00					
100	1-131-395-00						



## TANTALUM CAPACITORS

RATING						
CAP. (μF)	3 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	35 VOLT.
PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.033						1-131-273-00
0.047						1-131-274-00
0.068						1-131-275-00
0.1						1-131-276-00
0.15						1-131-277-00
0.22					1-131-262-00	1-131-278-00
0.33					1-131-263-00	1-131-279-00
0.47			1-131-169-00		1-131-264-00	1-131-280-00
0.68				1-131-258-00	1-131-265-00	1-131-281-00
1.0			1-131-254-00		1-131-266-00	1-131-282-00
1.5		1-131-250-00			1-131-267-00	1-131-283-00
2.2				1-131-259-00	1-131-268-00	1-131-284-00
3.3			1-131-255-00		1-131-269-00	-
4.7		1-131-251-00	1-131-171-00		1-131-270-00	-
6.8				1-131-260-00	1-131-271-00	-
10			1-131-256-00		1-131-272-00	-
15		1-131-252-00		1-131-261-00		-
22			1-131-257-00			-
33	1-131-176-00	1-131-253-00	1-131-173-00			-
47	1-131-288-00	1-131-174-00				-
100	1-131-177-00					-

## 1/4 WATT CARBON RESISTORS

$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-476-00	13k	1-246-500-00	130k	1-246-524-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-477-00	15k	1-246-501-00	150k	1-246-525-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-478-00	16k	1-246-502-00	160k	1-246-526-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-479-00	18k	1-246-503-00	180k	1-246-527-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-480-00	20k	1-246-504-00	200k	1-246-528-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-481-00	22k	1-246-505-00	220k	1-246-529-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-482-00	24k	1-246-506-00	240k	1-246-530-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-483-00	27k	1-246-507-00	270k	1-246-531-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-484-00	30k	1-246-508-00	300k	1-246-532-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-485-00	33k	1-246-509-00	330k	1-246-533-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-486-00	36k	1-246-510-00	360k	1-246-534-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-487-00	39k	1-246-511-00	390k	1-246-535-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00

## HARDWARE NOMENCLATURE

Screw:

P 3 x 10

L: Length in mm  
D: Diameter in mm  
Type of head

Indicated slotted-head only.

Unless otherwise indicated, it means cross-recessed head (Phillips type).



Nut, Washer, Retaining ring:

N 3

— Diameter of usable screw or shaft  
— Reference designation

Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		brazer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

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